



Ocean and Coastal Consultants, Inc.

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Ocean and Coastal Consultants, Inc. (OCC) is a 48 person consulting engineering firm, founded in 1983, that specializes in providing Coastal and Marine Engineering and related professional services to private and public clients. Its three offices in Connecticut (just north of NYC), New Jersey (Philadelphia), and Massachusetts (Boston) have executed projects on the east and west coasts, Guam, Hawaii, Aruba, and the Turks and Caicos. OCC provides professional engineering services for coastal projects (wave climate, sediment transport, erosion control, and flood protection), underwater inspection and resident engineering services with engineer divers, and permitting for coastal, dredging, and marine structures. OCC provides unique expertise for solving complex problems in the coastal and offshore environments.

OCC has state of the art computer and mathematical numerical modeling tools to enable modeling of coastal and offshore wave environments, sediment transport, and shoreline changes. Coastal processes analyses include the assessment of littoral drift, erosion and sedimentation patterns, storm damage, inlet and shoreline management plans, FEMA flood studies, and Letters of Map Revision. OCC has performed many engineering designs for beach nourishment, innovative coastal structures for shoreline stabilization and erosion control, port and harbor facilities, and marinas. OCC also performs Coastal Resource Evaluations that include determination of physical and biological coastal resources that may be impacted by construction, development, or dredging. OCC performs field delineation and monitoring of physical coastal resources such as beaches and dunes, and biological resources such as shellfish habitat and coastal vegetation, and determines the functional values of these physical and biological features. OCC strives to develop concepts and designs that improve or enhance the shoreline. OCC works closely with Municipal, State, and Federal regulatory agencies to develop designs that help offset and mitigate the effects of waterfront construction.

EXPERIENCE

The design expertise of the OCC encompasses civil, structural, geotechnical, and coastal engineering design for all types of marine and coastal structures, ranging from offshore structures such as offshore platforms, artificial reefs, through near-shore structures such as piers, wharves, artificial islands, and fish habitats to shore-connecting structures such as shore protection, fish bypasses.

Coastal Engineering

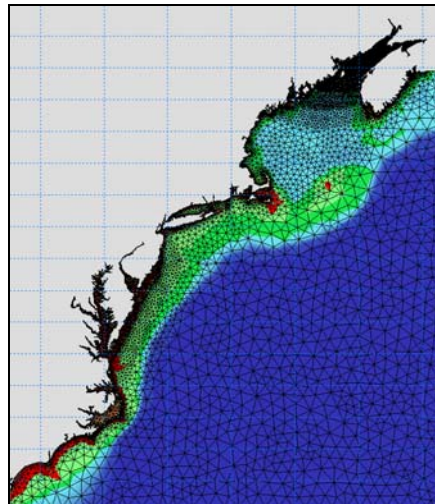
OCC is familiar with all aspects of coastal engineering from planning and design to construction supervision, and routinely utilize numerical models to support engineering design and analyses. In addition to coastal engineering design, we're experienced in the preparation of construction documents, including drawings, specifications, bid packages, cost estimates, risk analyses, and value engineering.

Major projects where we have provided **coastal engineering** services including shoreline modeling and analysis; design, permitting, construction, and monitoring of beach nourishment projects; and repair, rehabilitation, upgrade, or replacement of existing shoreline protection structures include the following:

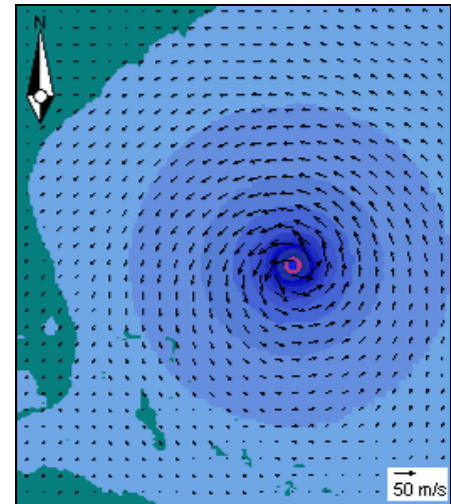
- Revel Entertainment Beach Restoration and Protection, Atlantic City, NJ – Phase I Concept Study, 2009;
- Scoping and Hydrological Analyses for Flood Insurance Study - FEMA Region I - York County, ME, Plymouth, Bristol Counties, Essex Counties, MA, 2009;
- IDIQ Contract for Underwater Inspections and Marine Engineering Services, USCG Station, Cape May, NJ, 2008;
- Stump Pass Innovative Beach Stabilization, Stump Pass State Park, Charlotte County, FL, 2004-2007;
- Huntington Erosion Control Study, Huntington, NY, 2006;
- Greenhill Seawall Repairs and Bank Stabilization, Town of Hull, MA, 2006;
- Coastal Analysis for Dike Reconstruction and Beach Nourishment in Plymouth, MA, 2004;
- Fourth Cliff Recreation Facility Shoreline Stabilization Study, Scituate, MA, 2003;
- Southwest Mordecai Ecosystem Restoration Project, Barnegat Bay, NJ, 2004-2007.
- Kitty Hawk Bay Stormwater and Marsh Restoration Project, Town of Kitty Hawk, NC, 2006.

Numerical Modeling Capabilities

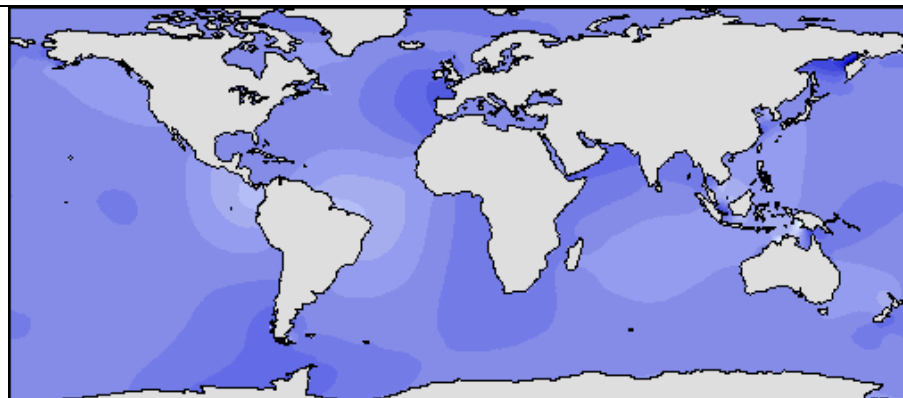
Members of the team are equally well versed in the use of other numerical model tools for hydraulic, hydrodynamic, and coastal engineering assessments, such as STWAVE, CGWAVE, CEDAS, SBEACH, MIKE21 and LitPack. These models are applicable to assessment of flow hydraulics, hydrodynamics, wave forecasting, coastal currents, wind- and wave-induced currents, longshore littoral transport, shoreline recession and accretion, flooding, wetlands restoration, and concentration and dispersal of sediments and pollutants.



East Coast Model Mesh.



Simulation of hurricane in FL region.



Global tidal constituents used for calibration of the model.

OCC has developed a global MIKE 21 model covering the East Coast of the US. The model is suitable for modeling of hydraulic phenomena in lakes, estuaries, bays, coastal areas and oceans. It is based on the numerical solution of the 2D shallow water equations which are the depth-integrated incompressible Reynold averaged Navier-Stokes equations. The spatial discretization of the equations is performed using a cell-centered finite volume method. The spatial domain is discretized by subdivision of the continuum into non-overlapping cells. In the horizontal plane an unstructured grid of triangles is used. The unstructured nature of the mesh enables the description of geometrically complex features in a local domain area at high detail, while at the same time allowing the model to span a large regional area. The model has been calibrated with tidal recordings from locations along the coast.